

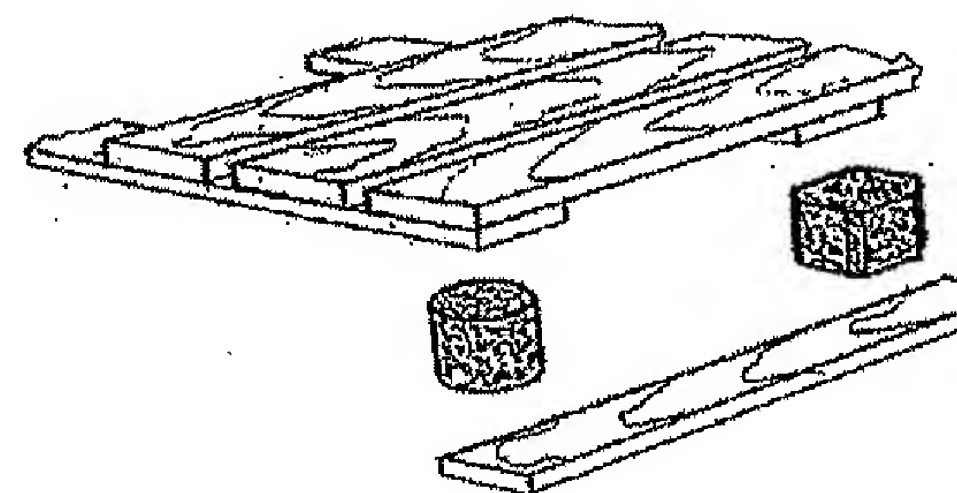
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(54) Manufacture process for wood waste-based composite products.

(57) The manufacture process of composite products from wood waste is remarkable in that wood waste, and namely lignocellulosic waste, is combined and compacted with prior introduction of a binder constituted of a previously heated thermoplastic resin, obtained from the family of recycled polyolefins, while cooling of the resin enabling a diffusion and distribution of polyolefins throughout the volume defined by the product. The invention finds numerous applications, notably in designing pallet dies, joinery mouldings, window framings, and others.



## MANUFACTURE PROCESS FOR WOOD WASTE-BASED COMPOSITE PRODUCTS

5 The invention concerns a manufacture product for wood waste-based composite products finding applications notably in manufacturing pallet dies, joinery mouldings, window framings, and more generally in wood waste-based products.

10 It is known to use wood waste from sawdust for recycling and using it for manufacturing new products. Generally, such waste under form of chaffs, fine chips, shavings, and the like, are compacted together with plastic material binders. The products obtained, after compaction, offer good strength quality. Also known are composite products manufactured from wood waste prepared from moulding thermohardening resins, such as UREA-FORMALIN resin.

Nevertheless, depending on the applications of the products obtained, some inconveniences have been noticed, preventing or limiting their use.

15 As far as plastic thermohardening material products are concerned, they present the inconvenience of being very heavy, although with good properties towards humidity. Besides, when inserting fastening parts such as nails, screws, staples, and the like, their hardness make it possible to sink such nails, but fail to hold them under pull-out. This can be inconvenient if compacted products are intended to be mounted and attached to others, i.e. in pallet application.

With regards to wood waste-based composite products bound with UREA-FORMALIN resin, a poor behavior towards humidity was noted leading to fast disintegration of the waste.

20 The objective of the invention was therefore to design a new wood waste-based composite product, presenting both good characteristics and resistance to humidity, while enabling an easy sinkage of fastening means such as nails, and assuring a very strong resistance to pull-out. In addition, another objective was to design a very light composite product, with a density approaching or similar to that of wood.

25 Such characteristics and others will be more obvious from the description that follows.

30 According to a first characteristic of the invention, the manufacture process of composite products from wood waste is remarkable in that wood waste, and namely lignocellulosic waste, is combined and compacted with prior introduction of a binder consisting of a previously heated thermoplastic resin, obtained from the family of recycled polyolefins, whereas cooling of the resin enables a diffusion and distribution of polyolefins throughout the volume defined by the product.

According to another characteristic, the binder consists of polypropylene. ✓

According to another characteristic, the binder consists of polyethylene. ✓

According to another characteristic, the composite products obtained find application in the manufacture of pallet die.

35 Represented in figures 1 and 2 of the drawing, as a non restrictive example, are pallet dies used in pallet manufacture, and different forms of dies are illustrated.

40 The manufacture process of wood waste-based composite products is remarkable in that wood waste and notably lignocellulosic waste produced by chain saws is compacted using a binder consisting in a low cost thermoplastic resin, said resin being obtained from the family of recycled polyolefin. One can thus define, according to the composite products obtained, a ratio between wood waste and binder i.e. proposed within the following range of 50 in 80 % of wood waste, and 50 to 20% of recycled polyolefins. Prior to use, said polyolefins are disintegrated with a grinder, or the like, to present as chaffs, those being then heated at an appropriated temperature to make them as fluid as a past enabling thus, upon product compaction and formation with said wood waste, a advantageous distribution of the binder throughout the

45 volume of the product to be obtained.

During hardening, such binder enables to obtain a product presenting great strength.

Therefore, the obtained products present an excellent surface status provided by aforementioned polyolefin aspect, said products enabled to be planed for appropriated custom shaping. The obtained products offer a remarkable wood aspect.

According to the conditions of use of the obtained composite product, and notably climatic environment, composite products will use a polyolefin-based binder, either of polypropylene in case a heat resistance requirement, or of polyethylene in case of a better cold resistance requirement.

5 The composite products obtained according to the invention offer in addition a great lightness, the close combination of waste and polyolefin binder provides sinkage for nail, and other fastening means, while assuring a very strong resistance to pull-out, comparable to similar pull-out means in oak wood.

10 The composite products according to the invention also offer a great resistance to the occurrence of strains such as mushrooms. Complementarily, studies and tests have been conducted on aforementioned products with regards notably to their biodegradability and showed that biologic degradation was satisfactory.

Composite products according to the invention offer in addition a very low dimensional variation to swelling from water with a very reduced humidity uptake, these important characteristics result from the product composition and, in particular, from polyolefin chaffs. Product realization can be done by compression as well as by extrusion.

15 All results obtained from composite products according to the invention are particularly surprising. From this fact and considering the characteristics obtained, composite products according to the invention find numerous applications.

One of the important applications of products composite objects of the invention, consists in making pallet dies.

20 In an advantageous and non restrictive way, pallet dies can have a round section, presenting an advantage over pallet dies made of wood that cannot present such section without additional turning operation, which entails higher manufacture cost. Pallet dies realized according to the invention, and of round section, are more cost effective than wood-made pallet dies.

25 Also, other applications include joinery mouldings, window framings, and more generally any building material using wood.

In addition, studies and tests have been conducted on aforementioned products concerning notably their biodegradability.

All previously described advantages are thus particularly interesting for pallet dies.